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PROCESSING CABBAGE CULTIVAR
EVALUATION TRIALS

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PROCESSING CABBAGE CULTIVAR EVALUATION TRIAL
FOR NORTHWESTERN OHIO

Dale Kretchman, Casey Hoy, Mark Jameson and Charles Willer

The cabbage cultivar trial was conducted at the Vegetable Crops Branch of the Ohio Agricultural Research and Development Center, near Fremont, Ohio. The soil is a sandy loam. The plots received 700 lbs. per acre of 10-20-20 plus 1 lb. per acre of boron pre-plant broadcast. In addition, 150 lbs. per acre of 6-24-12 was drilled to the side of each row at planting.

The study was field seeded on April 26 in rows spaced 30 ft. long on 30-in. centers. The rows were hand-thinned after emergence to 18 in. between plants. Each cultivar was replicated 4 times in a complete randomized block design.

Commercial practices for weed, insect and disease control were followed and no serious problems developed during the season. The season was abnormally hot and dry and thus, plots were irrigated when needed to maintain satisfactory growth.

When the majority of the heads in a plot reached maturity as indicated by size and firmness, the cultivars were evaluated for plant size, plant uprightness (for mechanical harvesting), uniformity and apparent head shape. After harvest weight and numbers of heads were recorded, 3 heads from each plot were cut and core length and equatorial and polar diameters recorded, internal color, leaf mid-rib thickness and tip burn were evaluated. Five heads were examined for susceptibility to thrips and evaluated for thrip injury.

Monthly rainfall totals were:

		<u>Irrigated</u>	
April 26 to 30	.27 in.	May 6	1.00 in.
May	.91 in.	May 13	1.00 in.
June	.63 in.	July 1	1.25 in.
July	2.84 in.		
August	5.68 in.		
September	1.81 in.		
To October 14	.28 in.		

Seed companies who provided seed for the trials include Bejo Zaden (BZ), Ferry Morse Seed Co. (FM), Harris-Moran Seed Co. (HM), Northrup King Co. (NK), Petoseed Co. (PS), Reed's Seeds (R), Stokes Seeds, Inc. (ST), and Sun Seeds, Inc. (SS).

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TABLE 1. Yield and quality characteristics of cabbage cultivars for processing. Replicated Trial-1988.

Cultivars	Source	Harvest Data				Measurements (in.)		
		Date harv.	Tons/acre	Lbs/head	% Cut	Core length	Polar diam.	Equat. diam.
Atria	R	9/14	41.8	7.9	95.9	3.00	7.58	8.25
Applause	HM	8/29	38.1	7.4	88.5	3.08	7.41	9.08
HMX-5252	HM	9/14	37.6	7.3	84.4	3.54	6.91	8.54
Quisto	NK	9/14	36.9	6.8	90.2	3.04	7.29	7.83
HMX-4245	HM	9/22	36.4	7.8	92.2	4.08	8.54	8.16
Superdane	R	9/22	35.1	6.5	94.8	3.75	7.12	7.79
Survivor	ST	9/2	34.8	7.1	88.3	3.00	7.33	7.91
Olympic	NK	8/29	34.7	7.7	82.7	3.83	7.33	8.87
Safekeeper	ST	9/2	34.2	7.2	81.3	4.12	7.58	7.95
Bravo	HM	9/2	33.9	7.2	91.1	3.20	7.41	8.45
Struckton	ST	10/14	33.5	6.9	97.5	3.41	7.41	7.45
Ocala	SS	9/14	32.8	6.3	88.1	3.16	7.08	8.25
Rio Verde	NK	9/14	32.7	7.1	84.0	3.58	6.91	8.70
Stonar	ST	10/14	32.6	6.6	89.0	3.25	7.12	7.37
Titanic 90	FM	8/29	32.3	6.9	83.0	3.58	7.50	8.12
Multikeeper	ST	10/14	30.8	6.1	98.3	3.00	6.29	7.25
Pennant	NK	8/29	30.3	6.8	76.8	2.66	7.66	7.75
Superkraut	R	9/14	29.6	7.2	66.7	3.45	7.66	8.37
Genesis	SS	9/2	29.1	6.2	81.3	2.75	7.75	8.00
King Cole	FM	8/19	25.4	5.1	82.1	3.79	6.66	7.08
Grenadier*	NK	8/23	20.4	4.6	74.0	----	----	----
LSD 5%			6.3	0.8	12.2	0.45	0.49	0.46

*Very early fresh market type - was mature to harvest prior to 8/23.

TABLE 2. Quality characteristic ratings of cabbage cultivars for processing. Replicated Trial-1988*.

Cultivar	Plant Characteristics*		
	Uniformity	Plant Size	Plant Uprightness
Atria	1	2	2
Applause	2	3	2
HMX-5252	2	2	2
Quisto	1	2	2
HMX-4245	2	3	2
Superdane	1	3	1
Survivor	1	3	2
Olympic	1	3	1
Safekeeper	3	3	2
Bravo	2	3	2
Struckton	1	2	1
Ocala	2	2	3
Rio Verde	2	3	2
Stonar	1	2	2
Titanic 90	1	3	2
Multikeeper	1	2	3
Pennant	2	2	1
Superkraut	1	3	3
Genesis	2	3	3
King Cole	-	-	-
Grenadier	-	-	-

* Uniformity: 1 = good; 2 = fair; 3 = poor

Plant Size: 1 = small; 2 = medium; 3 = large

Uprightness: 1 = upright; 2 = slightly tipped; 3 = very tipped

TABLE 3. Yield and quality characteristics of cabbage cultivars for processing. Observational Trial-1988.

Cultivars	Source	Harvest Date			Measurements (in.)		
		Date harv.	Tons/ acre	Lbs/ head	Core length	Polar diam.	Equat. diam.
Marvellen	R	8/29	40.1	7.68	3.00	8.00	8.00
PSR-63880 (R)	PS	8/29	21.3	6.13	3.00	7.80	7.80
Carlton	BZ	9/14	34.7	7.46	2.10	8.10	7.60

TABLE 4. Quality characteristics of cabbage cultivars for processing. Observational Trial-1988.

Cultivar	Plant Characteristics*		
	Uniformity	Plant Size	Plant Uprightness
Marvellen	2	3	2
PSR-63880 (R)	1	2	2
Carlton	2	3	2

*Uniformity: 1 = good; 2 = fair; 3 = poor

Plant Size: 1 = small; 2 = medium; 3 = large

Uprightness: 1 = upright; 2 = slightly tipped; 3 = very tipped

TABLE 5. Onion thrips damage to processing cabbage cultivars-1988*

Cultivar	Cull Wt. (gm)	Head Wt. (gm)	Damage rating	Trim Time (sec)
Ocala	0.0	2697	0.00	6.9
Bravo	0.0	3148	0.00	6.9
Safekeeper	0.4	3207	0.05	7.2
Superkraut	1.3	2982	0.10	7.4
Titanic 90	7.3	2960	0.15	8.0
Genesis	12.0	2474	0.25	8.4
Applause	20.7	3047	0.60	10.6
Pennant	21.3	2954	0.50	11.9
Rio Verde	32.0	3006	0.35	13.0
King Cole	44.6	2203	0.70	--
Olympic	66.2	3190	0.60	13.9
HMX-4245	114.7	3429	0.95	17.5
HMX-5252	131.3	2830	1.25	23.1
Atria	183.0	3121	1.25	24.2
Multikeeper	256.2	2315	2.00	31.4
Superdane	305.5	2395	2.25	36.0
Struckton	314.2	2673	2.20	38.4
Stonar	437.2	2410	2.25	39.7
Quisto	708.0	2295	3.60	62.8
Survivor	<u>738.9</u>	<u>2468</u>	<u>3.40</u>	<u>55.6</u>
Fisher's PLSD	148.2	406	0.68	9.6

*Cull weight refers to the average amount of cabbage that had to be trimmed from the head to remove all thrips injury. Head weight is the average weight of the cabbage head after thrips injury has been removed. Damage ratings were on a scale of 0 (no injury) to 4 (severe bronzing extending several layers into the head). Trim time is the average time required to trim all thrips off the cabbage heads.

TABLE 6. Quality observations on cultivars and lines including internal quality - 1988.

Cultivar	Comments
Superkraut	Large frame, good uniformity, very tipped, thick mid-ribs, white inside, no outside basal buds, few internal buds, mild flavor.
Titanic 90	Large frame, good uniformity, slightly tipped, moderate to heavy mid-ribs, white inside, no outside basal buds, no internal buds, mild flavor, large crooked core.
Genesis	Large frame, fair uniformity, very tipped, medium to heavy mid-ribs, white inside, very large outside basal buds, very small internal buds, mild flavor.
Survivor	Large frame, good uniformity, slightly tipped, medium mid-ribs, yellowish green inside, no outside basal buds, very small internal buds, mild flavor.
Struckton	Medium frame, good uniformity, upright, thick mid-ribs, light yellow inside, no outside or internal buds, strong flavor.
Stonar	Medium frame, good uniformity, slightly tipped, long stem, very late, narrow cupped leaves, medium mid-ribs, light yellow inside, crooked core, mild flavor.
Multikeeper	Medium frame, good uniformity, very tipped, large outside basal buds, medium large ribs, white inside, gray color at top of core, undesirable off-flavor.
Safekeeper	Large frame, poor uniformity, slightly tipped, large mid-ribs, white inside, few outside basal buds, cracked core, sweet to slightly strong flavor.
Olympic	Large frame, good uniformity, upright, medium mid-ribs, light yellowish green inside, strong flavor.
Quisto	Medium frame, good uniformity, slightly tipped, thick mid-ribs, white inside, sweet mild flavor.
Pennant	Medium frame, fair uniformity, upright, medium, mid-ribs, light yellowish green inside, mild flavor.
Grenadier	No observations made, an early fresh-market type.

Cultivar	Comments
Rio Verde	Large frame, fair uniformity, slightly tipped, thick mid-ribs, white inside, some outside basal buds, strong flavor.
HMX-4245	Large frame, fair uniformity, slightly tipped, plants are blue-green in color, medium mid-ribs, yellowish white inside.
HMX-5252	Medium frame, fair uniformity, slightly tipped, medium mid-ribs, light green inside, few external and internal basal buds, mild flavor.
Applause	Large frame, fair uniformity, slightly tipped, thick mid-ribs, white inside, strong flavor, has highly promising characteristics.
Ocala	Medium frame, fair uniformity, very tipped, medium mid-ribs, light green inside, few small basal buds, strong flavor.
Bravo	Large frame, fair uniformity, slightly tipped, medium mid-ribs, yellowish white inside, very large outside basal buds, small inside basal buds, mild flavor.
Atria	Medium frame, good uniformity, slightly tipped, medium mid-ribs, yellowish green inside, crooked core, strong flavor.
Superdane	Large frame, good uniformity, upright, thick, mid-ribs, yellowish-green inside, few internal basal buds, brown tip at core, bland flavor.
Marvellen	Large frame, fair uniformity, slightly tipped, thick mid-ribs, white inside, sweet flavor.
PSR-63880(R)	Medium frame, good uniformity, slightly tipped, medium mid-ribs, white inside, strong flavor.
Carlton	Large frame, fair uniformity, slightly tipped, large mid-ribs, leaves very upright, yellow inside, mild flavor.

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